

THAT WHICH IS CLAIMED:

1. A fiber optic cable comprising:

at least one optical waveguide, wherein the at least one optical waveguide has a predetermined length; and

5 at least one water-swellaable yarn, the at least one water-swellaable yarn having a predetermined length, the predetermined length of the at least one water-swellaable yarn being greater than the predetermined length of the at least one optical waveguide, wherein the at least one water-swellaable yarn is
10 disposed longitudinally relative to the at least one optical waveguide so that the at least one water-swellaable yarn and the at least one optical waveguide generally act as independent bodies within a common longitudinal cavity.

15 2. The fiber optic cable according to claim 1, the predetermined length of the at least one water-swellaable yarn being at least about 0.05% longer than the predetermined length of the at least one optical waveguide.

20 3. The fiber optic cable according to claim 1, the predetermined length of the at least one water-swellaable yarn being at least about 0.1% longer than the predetermined length of the at least one optical waveguide.

25 4. The fiber optic cable according to claim 1, the at least one water-swellaable yarn has a denier of about 5000 or less and comprises at least two filaments that are stranded together, and at least one of the two filaments being a water-swellaable filament.

30 5. The fiber optic cable according to claim 1, the at least one water-swellaable yarn has a denier of about 2500 or less and comprises at least two filaments that are stranded together with about ten TPI or less during a no-load condition, and at least

one of the at least two filaments being a water-swella-
ble filament.

6. The fiber optic cable according to claim 1, further
5 comprising a lubricant on a portion of the at least one optical
waveguide.

7. The fiber optic cable according to claim 1, further
comprising a silicone oil on a portion of the at least one
10 optical waveguide.

8. The fiber optic cable according to claim 1, the at least one
optical waveguide being a portion of a fiber optic ribbon, the
fiber optic ribbon having a predetermined ribbon length that is
15 less than the predetermined length of the at least one water-
swella-ble yarn.

9. The fiber optic cable according to claim 1, further
comprising a tube, the tube being the common longitudinal cavity.
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10. An optical tube assembly comprising:
a tube;

at least one optical waveguide, the optical waveguide being
disposed in the tube, wherein the at least one optical waveguide
25 has a predetermined length; and

at least one water-swella-ble yarn, the at least one water-
swella-ble yarn being disposed within the tube and having a
predetermined length, the predetermined length of the at least
one water-swella-ble yarn being greater than the predetermined
30 length of the at least one optical waveguide, wherein the at
least one water-swella-ble yarn is disposed longitudinally
relative to the at least one optical waveguide so that the at
least one water-swella-ble yarn and the at least one optical
waveguide generally act as independent bodies within the tube.

11. The optical tube assembly according to claim 10, the predetermined length of the at least one water-swella-
ble yarn being at least about 0.05% longer than the predetermined length
5 of the at least one optical waveguide.

12. The optical tube assembly according to claim 10, the predetermined length of the at least one water-swella-
ble yarn being at least about 0.1% longer than the predetermined length of
10 the at least one optical waveguide.

13. The optical tube assembly according to claim 10, the at least one water-swella-
ble yarn has a denier of about 5000 or less and comprises at least two filaments that are stranded together,
15 and at least one of the two filaments being a water-swella-
ble filament.

14. The optical tube assembly according to claim 10, the at least one water-swella-
ble yarn has a denier of about 2500 or less
20 and comprises at least two filaments that are stranded together with about ten TPI or less during a no-load condition, and at least one of the at least two filaments being a water-swella-
ble filament.

25 15. The optical tube assembly according to claim 10, the at least one optical waveguide having an excess length compared with a length of the tube.

16. The optical tube assembly according to claim 10, further
30 comprising a lubricant on a portion of the at least one optical waveguide.

17. The optical tube assembly according to claim 10, further comprising a silicone oil on a portion of the at least one optical waveguide.

5 18. The optical tube assembly according to claim 10, the at least one optical waveguide being a portion of a fiber optic ribbon, the fiber optic ribbon having a predetermined ribbon length that is less than the predetermined length of the at least one water-swellable yarn.

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19. The optical tube assembly according to claim 10, the optical tube assembly being a portion of a cable.

20. The optical tube assembly according to claim 10, the optical
15 tube assembly being a portion of a cable, wherein the optical tube assembly is stranded about a central member.

21. The optical tube assembly according to claim 10, the optical tube assembly being a portion of a figure eight cable.

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22. An optical tube assembly comprising:

a tube;

at least one optical waveguide, the optical waveguide being
disposed in the tube, wherein the at least one optical waveguide
25 has a predetermined length;

a lubricant, the lubricant being disposed on a portion of
the at least one optical waveguide; and

at least one water-swellable yarn, the at least one water-
swellable yarn being disposed within the tube and having a
30 predetermined length, the predetermined length of the at least
one water-swellable yarn being at least about 0.05% longer than
the predetermined length of the at least one optical waveguide,
wherein the at least one water-swellable yarn is disposed
longitudinally relative to the at least one optical waveguide so

that the at least one water-swellaable yarn and the at least one optical waveguide generally act as independent bodies within the tube.

5 23. The optical tube assembly according to claim 22, the predetermined length of the at least one water-swellaable yarn being at least about 0.1% longer than the predetermined length of the at least one optical waveguide.

10 24. The optical tube assembly according to claim 22, the at least one water-swellaable yarn has a denier of about 5000 or less and comprises at least two filaments that are stranded together, and at least one of the at least two filaments being a water-swellaable filament.

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25. The optical tube assembly according to claim 22, the at least one water-swellaable yarn has a denier of about 2500 or less and comprises at least two filaments that are stranded together with about ten TPI or less during a no-load condition, and at
20 least one of the at least two filaments being a water-swellaable filament.

26. The optical tube assembly according to claim 22, the at least one optical waveguide having an excess length compared with
25 a length of the tube.

27. The optical tube assembly according to claim 22, the lubricant being a silicone oil.

30 28. The optical tube assembly according to claim 22, the at least one optical waveguide being a portion of a fiber optic ribbon, the fiber optic ribbon having a predetermined ribbon length that is less than the predetermined length of the at least one water-swellaable yarn.

29. The optical tube assembly according to claim 22, the optical tube assembly being a portion of a cable.

5 30. The optical tube assembly according to claim 22, the optical tube assembly being a portion of a cable, wherein the optical tube assembly is stranded about a central member.

31. The optical tube assembly according to claim 22, the optical
10 tube assembly being a portion of a figure eight cable.

32. A fiber optic cable comprising:

a central member;

a tube, the tube being stranded about the central member;

15 at least one optical waveguide, the optical waveguide being disposed in the tube, wherein the at least one optical waveguide has a predetermined length; and

at least one water-swellaable yarn, the at least one water-swellaable yarn being disposed within the tube and having a
20 predetermined length, the predetermined length of the at least one water-swellaable yarn being greater than the predetermined length of the at least one optical waveguide, wherein the at least one water-swellaable yarn is disposed longitudinally relative to the at least one optical waveguide so that the at
25 least one water-swellaable yarn and the at least one optical waveguide generally act as independent bodies within the tube.

33. The fiber optic cable according to claim 32, the predetermined length of the at least one water-swellaable yarn
30 being at least about 0.05% longer than the predetermined length of the at least one optical waveguide.

34. The fiber optic cable according to claim 32, the predetermined length of the at least one water-swellaable yarn

being about 0.1% longer than the predetermined length of the at least one optical waveguide.

35. The fiber optic cable according to claim 32, the at least
5 one water-swellaable yarn has a denier of about 5000 or less and comprises at least two filaments that are stranded together, and at least one of the at least two filaments being a water-swellaable filament.

10 36. The fiber optic cable according to claim 32, the at least one water-swellaable yarn has a denier of about 2500 or less and comprises at least two filaments that are stranded together with about ten TPI or less during a no-load condition, and at least one of the at least two filaments being a water-swellaable
15 filament.

37. The fiber optic cable according to claim 32, the at least one optical waveguide having an excess length compared with a length of the tube.

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38. The fiber optic cable according to claim 32, further comprising a lubricant on a portion of the at least one optical waveguide.

25 39. The fiber optic cable according to claim 32, further comprising a silicone oil on a portion of the at least one optical waveguide.

40. The fiber optic cable according to claim 32, the at least
30 one optical waveguide being a portion of a fiber optic ribbon, the fiber optic ribbon having a predetermined ribbon length that is less than the predetermined length of the at least one water-swellaable yarn.

41. The fiber optic cable according to claim 32, further comprising a jacket, the jacket being flame-retardant.

42. A method of making a fiber optic tube assembly, comprising
5 the steps of:

paying off at least one optical waveguide, the optical waveguide having a predetermined length;

paying off at least one water-swellaable yarn, the optical waveguide having a predetermined length;

10 maintaining the predetermined length of the at least one water-swellaable yarn so that its predetermined length is greater than the predetermined length of the at least one optical waveguide; and

extruding a tube about the at least one optical waveguide
15 and the at least one water-swellaable yarn, wherein the at least one water-swellaable yarn is disposed longitudinally relative to the at least one optical waveguide so that the at least one water-swellaable yarn and the at least one optical waveguide are able to act as independent bodies within the tube.

20 43. The method according to claim 42, further comprising maintaining the predetermined length of the at least water-swellaable yarn at least about 0.05% longer than the predetermined length of the at least one optical waveguide.

25 44. The method according to claim 42, further comprising maintaining the predetermined length of the at least water-swellaable yarn at least about 0.1% longer than the predetermined length of the at least one optical waveguide.

30 45. The method according to claim 42, further comprising the step of applying a lubricant on a portion of the at least one optical waveguide.

46. The method according to claim 42, further comprising extruding a jacket about the fiber optic tube assembly, thereby forming a fiber optic cable.

5 47. A fiber optic cable comprising:
at least one optical waveguide;
a lubricant, the lubricant being disposed on a portion of
the at least one optical waveguide; and
at least one water-swellaable yarn, the at least one water-
10 swellaable yarn has a denier of about 5000 or less and comprises
at least two filaments that are stranded together, and at least
one of the two filaments being a water-swellaable filament,
wherein the at least one water-swellaable yarn is disposed
longitudinally relative to the at least one optical waveguide so
15 that the at least one water-swellaable yarn and the at least one
optical waveguide generally act as independent bodies within a
common longitudinal cavity.

48. The fiber optic cable according to claim 47, the at least
20 one optical waveguide having a predetermined length and the at
least one water-swellaable yarn having a predetermined length,
wherein the predetermined length of the at least one water-
swellaable yarn is greater than the predetermined length of the at
least one optical waveguide.

25 49. The fiber optic cable according to claim 48, the
predetermined length of the at least one water-swellaable yarn
being at least about 0.05% longer than the predetermined length
of the at least one optical waveguide.

30 50. The fiber optic cable according to claim 48, the
predetermined length of the at least one water-swellaable yarn
being at least about 0.1% longer than the predetermined length of
the at least one optical waveguide.

51. The fiber optic cable according to claim 47, the at least one water-swellaable yarn has a denier of about 2500 or less.

5 52. The fiber optic cable according to claim 47, the lubricant being a silicone oil.